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ABSTRACT

This paper presents a rationale for teaching higher level thinking skills to students with special needs, including those with mild mental handicaps and learning disabilities. It briefly reviews the literature on teaching such skills, stressing that thinking skills can be taught through specific teaching methods such as a four-step method (introduce the skill, explain the skill, demonstrate the skill, apply the skill) and careful questioning. Incorporation of higher level thinking skills into life skills is stressed, and teaching students use of the I PLAN five-step motivational and learning strategy is urged. Evidence of the I PLAN model strategy's effectiveness in increasing student input to Individualized Education Programs is offered. (12 references) (DB)

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HIGHER ORDER THINKING SKILLS FOR STUDENTS WITH SPECIAL NEEDS

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ABSTRACT

This session will focus on higher order thinking skills special needs students should develop and use if they are to become more independent learners. Increased verbal interaction, skillful questioning, and organization of knowledge are some of the skills which will be demonstrated and discussed particularly as they relate to the Education Planning Strategy. Handouts will be provided for those in attendance.

HIGHER ORDER THINKING SKILLS FOR STUDENTS WITH SPECIAL NEEDS

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There are many reasons for the increasing emphasis on the promotion of higher order thinking skills in the education of children. One is the report that American children are falling behind other children in the other Western countries in academic achievement. Another is the recognition that with the information explosion students must learn to independently access information, solve problems, and make better

decisions. Philosophically, the potential of cognitive and metacognitive principles of cognitive psychology is available to make learners more efficient and effective.

Special Needs Students

While all students need to strengthen and use effective thinking skills, children with special needs especially require instruction in these skills. Precisely because they have had difficulty with the development of thinking skills, their instruction has focused on rote memoriztion and fostered dependence and "learned helplessness". Educators must begin to give attention to the higher order cognitive processes necessary for academic success and personal adjustment. Observing, describing, organizing, questioning, problem solving, and time management are all higher order thinking skills which must be fostered in students with special needs if they are to become independent learners using all their mental ability.

Some teachers may feel little can be done with these students. Other teachers may feel only gifted students are capable of benefiting from such training. Yet, teachers are in a position to shape all students' thinking. Teachers structure the learning experiences and establish the learning climate. The way they go about this influences student

achievement, self-concept, social interactions, and the level of thinking far more than textbooks, curriculum, or extra-curriculum activities. In addition , research supports the value of teaching higher order thinking skills to students with special needs. On a test of problem solving in health promotion, high school students with mild handicaps in a higher order thinking intervention scored significantly higher than students who were non-handicapped who completed a traditional high school health class (Woodward, Carnie, & Gersten, 1988). Middle school students with learning disabilities were mainstreamed for a higher order thinking intervention in science. On a test of misconception in earth science, the students showed better conceptual understanding than Harvard graduates interviewed in Schnep's 1987 film, A Private Universe (Mathukrishna, Carnie, Grossen & Miller, (1990). On a variety of measures of argument construction and critizing, high school students with mild handicaps in a higher order intervention scored as high or higher than high school students in an honors English class and college students enrolled in a teacher certification program (Grossen & Carnie, 1990).

Teaching for Higher Order Thinking

Almost twenty years ago, Fraenkel (1973) gave the following assumptions about thinking skills:

1. Thinking skills can be taught;
2. All subjects offer an appropriate context for thinking;
3. All children are capable of thinking at abstract levels, although the quality of thinking may differ;
4. Precise teaching strategies can be taught which will encourage and improve student thinking.

Since then, other educators and researchers have supported Fraenkel's assumptions (Beyer, 1987; Paul, 1990; Raths, et al, 1986; Schwartz & Perkins, 1990).

Beyer (1987) has provided a taxonomy of thinking skills which defines micro-thinking skills, critical teaching skills, and major thinking operations.

Insert Figure 1 about here

Micro-teaching skills can be considered the building blocks for major thinking operations so it is recommended that teachers begin at this level. A four step method devised by Scwartz and Perkins (1989) serves as a strategy guide:

1. Introduce the skill. This involves giving a skill a name from the taxonomy such as classification, judging the credibility of an observation, decision making, for example.
2. Explain the skill. Classification involves looking for similarities, noting important sameness. Judging the credibility of an observation involves noting the length of time between the report and the observation, noting whether the report was made by the observer him/herself, determining if it could be corroborated by

other sources, etc.

3. Demonstrate the skill. "Talk-aloud" through the steps of a problem so that the student can witness the cognitive process occurring. Use examples which are relevant and familiar so students can concentrate on the process.

4. Apply the skill. Give students the opportunity to practice the skill in subject content and to generalize it. Help students understand why it is important and how it will benefit them not only in school but in their daily activities.

Another way to encourage higher order thinking is through careful questioning. Questions requiring multiple answers can promote active learning through increasing verbal interaction. Pair problem solving, cooperative learning, brainstorming, three second wait time, and clarification are all useful strategies. Encouraging interaction discussion requires creating a classroom environment for learning to think. This is done by the way the teacher structures it, gives directions, responds to ideas, selects content, allots time, and most importantly, models thinking (Raths, 1986).

Helping students to organize knowledge and learning is also

important for students with special needs. Advance organizers, comparison charts, concept mapping, learning strategies, and time management are vital for the teachers, repertoire of skills for teaching thinking.

Incorporating Higher Thinking Skills into Life Skills

The culmination of teaching micro-thinking and critical thinking skills is to integrate them into major thinking operations such as problem solving and decision making. Perhaps one of the most timely and essential major thinking operations students with special needs can be helped to acquire is to have a more active role in their educational planning. An example of how higher order thinking skills can be used as a learning strategy is through a technique called I Plan (Van Reusen, Bos, Shumaker,& Deshler 1987). Students learn to use a five step strategy which focuses on effective planning and communication.

Insert Figure 2 about here

The acronym "I PLAN" is used to assist students in remembering the

strategy. During the initial steps, students are encouraged to think about their strengths and weaknesses in a variety of areas including academic, social and vocational. Their reflections are recorded on inventory sheets used to develop goals they need to obtain. Students also decide how they might best meet these goals. They consider such factors as size of their learning group, style of instruction, and how they would like to be evaluated. Once the information is recorded and classified, the students prepare for an active role in their Individual Education Plan (IEP) conference. Through simulation activities before the actual conference, students are guided in such higher order thinking skills as critical questioning, advanced organization, and cooperative decision making. It is recommended (Van Reusen & Bos, 1990) that students initially learn the strategy a week or two before their planning conference. It takes about 4 to 6 hours for most students to learn the strategy. Results from the strategy use have been most promising. In a study with junior high students with learning disabilities (Bos & Van Reusen, 1989) students receiving the strategy instruction made an average of 109 contributions during their IEP conferences, while students who only received an overview averaged 31 contributions. In another study (Van Reusen, Deshler & Shumaker, 1987), the goals of high school students identified in

their conferences were matched with the goals which appeared in their written IEPs'. For students who learned the strategy, 86% of their goals appeared on their IEPs'. With the contrast group who had not learned the strategy, only 13% of their goals appeared on their IEPs'.

Conclusion

In these times of educational reform with its increasing emphasis on teaching higher level thinking, education cannot afford to continue its heavy emphasis on basic skills to the exclusion of problem solving and decision making for students with special needs. This group is increasingly being shown to be very responsive to such instruction. Teaching higher order thinking skills is necessary if students with special needs are to become more independent and better prepared for challenges in school and in life.

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Figure 1

Taxonomy of Thinking Skills

Micro-Thinking Skills

Recall
Translation
Interpretation
Extrapolation
Application
Analysis
Compare, contrast, classify, seriate, etc.
Evaluation

Critical Thinking Skills

1. the assessing of the authenticity, accuracy, and/or worth of knowledge claims and arguments
2. the judging of statements based on acceptable standards
3. the process of examining materials in the light of related objective evidence, comparing the object or statement with some norm or standard, and concluding or acting upon the judgement made
4. Evaluating statements, arguments and experiences
5. assessing of statements and spotting of faults
6. careful, precise, persistent, and objective analysis of any knowledge, claim or belief to judge its validity and/or worth
7. knowing when to question something and what sort of question to ask

Major Thinking Strategies

Problem Solving	Decision Making
1. Recognize a problem	1. Define the goal
2. Represent the problem	2. Identify the alternatives
3. Devise/choose solution plan	3. Analyze alternatives

Figure 2

Thinking Skills needed for Motivational Strategy "I PLAN"

Reflective Thinking

Goal Setting

Questioning

Organizing

Decision Making

Time Management

Self Monitoring